



## Designation: D4204 – 16 (Reapproved 2023)

# Standard Practice for Preparing Plastic Film Specimens for a Round-Robin Study<sup>1</sup>

This standard is issued under the fixed designation D4204; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This practice covers the preparation of test sets of plastic film specimens for subsequent use in an interlaboratory round-robin study to evaluate the precision of a test method.

1.2 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

NOTE 1—There is no known ISO equivalent to this standard.

1.3 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

## 2. Referenced Documents

2.1 *ASTM Standards:*<sup>2</sup>

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

## 3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *film specimen*—one piece of a sample obtained by cutting across the width of the sample and to a length such that one test specimen can subsequently be prepared.

NOTE 2—For any sample in a laboratory, the specified number of film specimens in a test unit ( $n_1$ ) are tested to produce a single test result in a short-time period, while replicate test results are obtained over a longer time period. Thus, there are within-laboratory components of variability for both short-term and long-term testing. This practice calls these within-day and between-day components of variability, inasmuch as

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.19 on Film, Sheeting, and Molded Products.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

round-robin protocols often specify that replicate test results be obtained on different days.

3.1.2 *sample*—a quantity of film of a width appropriate to the test method under study and of a length sufficient to yield the total number of film specimens needed for the planned round-robin study.

3.1.3 *test result*—the value (usually, the arithmetic average) of the property derived from one test unit.

3.1.4 *test set*—a group of several film specimens, in a number greater than that specified for a test unit.

3.1.5 *test specimen*—the individual piece of film to be tested, usually of specified dimensions, that is to be cut from one film specimen and tested, to produce one value of the property, or properties, by the test method under study.

3.1.6 *test unit*—a specified number of film specimens from which an equal number of test specimens is to be prepared and tested in a short-time span to yield one test result for each property.

## 3.2 Abbreviations:

RR	=	round-robin study
$q$	=	number of samples to be used in the RR
$r$	=	total number of film assemblies that will be needed for each lab to complete the necessary testing
$n_1$	=	specified number of film specimens in a test unit
$n_2$	=	number of additional film specimens in each test set
$p_1$	=	number of laboratories participating in the RR
$p_2$	=	number of additional “latent” laboratories provided for in the specimen preparation procedure
$L_1$	=	film-specimen length appropriate for preparing one test specimen
$L_2$	=	total length of film necessary to produce samples from participating plus latent laboratories; $L_2 = (p_1 + p_2)(L_1)$
SD	=	standard deviation for a single source of variability for one given sample
$S_1$	=	standard deviation for within-laboratory within-day variability of a test value
$S_2$	=	standard deviation for within-laboratory variability of a test result
$S_3$	=	standard deviation for between-laboratory variability of a test result
$S_4$	=	standard deviation for within-sample variability